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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/362,058

07/28/1999

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P99.0922

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7590

05/08/2008

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EXAMINER

DIEP, NHON THANH

ART UNIT

PAPER NUMBER

2621

MAIL DATE

DELIVERY MODE

05/08/2008

PAPER

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MASANORI IWASAKI

Appeal 2007-3032
Application 09/362,058¹
Technology Center 2600

Decided: May 8, 2008

Before ANITA PELLMAN GROSS, MAHSHID D. SAADAT, and
SCOTT R. BOALICK, *Administrative Patent Judges*.

BOALICK, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134(a) from the final rejection of claims 1, 2, 5, and 6, all the claims pending in the application. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

¹ Application filed July 28, 1999. The real party in interest is Sony Corporation.

STATEMENT OF THE CASE

Appellant's invention relates to a three-dimensional image capturing apparatus that obtains a three-dimensional (stereo) image of a subject.

Claim 1 is exemplary:

1. A three-dimensional image-capturing apparatus comprising:

a single solid-state image-sensing device having a plurality of image capturing regions, each image capture region simultaneously captures a different image on the single solid-state image-sensing device;

a plurality of optical systems for forming a different image of a subject in each image- capturing region, each one of the optical systems corresponding to a different one of the image-capturing regions, each optical system having:

an imaging-side reflection means located in front of the corresponding image- capturing region and directed in an obliquely outward direction;

a subject-side reflection means located outward from said imaging-side reflection means and directed in an obliquely inward direction;

a lens provided in an optical path between said imaging-side reflection means and said single solid-state image-sensing device;

a light-limiting means provided in an optical path between said imaging-side reflection means and said

lens, the light-limiting means preventing incidence of flux of ambient light other than from rays forming each image of said subject; and

an infrared cut filter provided in an optical path between said lens and said single solid-state image-sensing device; and

a light-shielding means provided normal to the single solid-state image-sensing device and at least between the single solid-state image-sensing device and the imaging-side reflection means so as to prevent optical cross talk between the optical systems,

wherein the optical systems are used to form, in the corresponding image-capturing regions, separate and different images of said subject which are captured from different viewpoints having a distance therebetween.

The prior art relied upon by the Examiner in rejecting the claims on appeal is:

Kobu	JP-60037520	Feb. 26, 1985
Ishihara	US 5,737,084	Apr. 7, 1998
Moreton	US 5,835,133	Nov. 10, 1998
Tabata	US 6,177,952 B1	Jan. 23, 2001 filed Dec. 22, 1997
Suzuki	US 6,437,824 B1	Aug. 20, 2002 filed Feb. 3, 1998

Claims 1, 2, and 5 stand rejected under 35 U.S.C. § 103(a) as being obvious over Moreton, Ishihara, Kobu, and Suzuki.

Claim 6 stands rejected under 35 U.S.C. § 103(a) as being obvious over Moreton, Ishihara, Kobu, Suzuki, and Tabata.

Rather than repeat the arguments of Appellant or the Examiner, we make reference to the Briefs and the Answer for their respective details. Only those arguments actually made by Appellant have been considered in this decision. Arguments that Appellant did not make in the Briefs have not been considered and are deemed to be waived. *See* 37 C.F.R. § 41.37(c)(1)(vii).²

ISSUE

The issue is whether Appellant has shown that the Examiner erred in rejecting the claims under 35 U.S.C. § 103(a). That is, given the teachings of the prior art, has Appellant shown that the differences between the claims and the prior art are sufficient to render the claimed subject matter unobvious to a person skilled in the art at the time the invention was made?

² Except as will be noted in this opinion, Appellant has not presented any substantive arguments directed separately to the patentability of the dependent claims or related claims in each group. In the absence of a separate argument with respect to those claims, they stand or fall with the representative independent claim. *See* 37 C.F.R. § 41.37(c)(1)(vii).

PRINCIPLES OF LAW

All timely filed evidence and properly presented arguments are considered by the Board in resolving an obviousness issue on appeal. *See In re Piasecki*, 745 F.2d 1468, 1472 (Fed. Cir. 1984).

In the examination of a patent application, the Examiner bears the initial burden of showing a *prima facie* case of unpatentability. *Id.* at 1472. When that burden is met, the burden then shifts to the applicant to rebut. *Id.*; *see also In re Harris*, 409 F.3d 1339, 1343-44 (Fed. Cir. 2005) (finding rebuttal evidence unpersuasive). If the Applicant produces rebuttal evidence of adequate weight, the *prima facie* case of unpatentability is dissipated. *In re Piasecki*, 745 F.2d at 1472. Thereafter, patentability is determined in view of the entire record. *Id.* However, on appeal to the Board it is an Appellant's burden to establish that the Examiner did not sustain the necessary burden and to show that the Examiner erred. *See In re Kahn*, 441 F.3d 977, 985-86 (Fed. Cir. 2006) ("On appeal to the Board, an applicant can overcome a rejection [for obviousness] by showing insufficient evidence of *prima facie* obviousness or by rebutting the *prima facie* case with evidence of secondary indicia of nonobviousness.") (quoting *In re Rouffet*, 149 F.3d 1350, 1355 (Fed. Cir. 1998)).

"Section 103 forbids issuance of a patent when 'the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.'" *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727,

1734 (2007). In *KSR*, the Supreme Court reaffirmed that "[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *Id.* at 1739. The Court explained:

When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.

Id. at 1740. The Court also explained that:

[o]ften, it will be necessary . . . to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.

Id. at 1740-41.

"[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *In re Kahn*, 441 F.3d at 988. "To facilitate review, this

analysis should be made explicit." *KSR*, 127 S. Ct. at 1741. However, "the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." *Id.*

The Supreme Court noted that "[u]nder the correct analysis, any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed." *Id.* at 1742. The Court also noted that "[c]ommon sense teaches . . . that familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle." *Id.* at 1742. "A person of ordinary skill is also a person of ordinary creativity, not an automaton." *Id.*

Furthermore, the Supreme Court explained that "[w]hen there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp." *KSR*, 127 S. Ct. at 1742. "If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense," *id.* and, in such an instance "the fact that a combination was obvious to try might show that it was obvious under § 103" *id.*

In sustaining a multiple reference rejection under 35 U.S.C. § 103(a), the Board may rely on one reference alone without designating it as a new

ground of rejection. *In re Bush*, 296 F.2d 491, 496 (CCPA 1961); *In re Boyer*, 363 F.2d 455, 458 n.2 (CCPA 1966).

During examination of a patent application, a claim is given its broadest reasonable construction consistent with the specification. *In re Prater*, 415 F.2d 1393, 1404-05 (CCPA 1969). "[T]he words of a claim 'are generally given their ordinary and customary meaning.'" *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (internal citations omitted). The "ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application." *Id.* at 1313.

ANALYSIS

Appellant contends that the Examiner erred in rejecting claims 1, 2, 5, and 6. Reviewing the record before us, we do not agree. In particular, we find that the Appellant has not shown that the Examiner failed to make a prima facie showing of obviousness with respect to claims 1, 2, 5, and 6. Appellant failed to meet the burden of overcoming that prima facie showing.

Appellant has argued claims 1, 2, and 5 together as a group. (App. Br. 4-8; Reply Br. 4-6.) Thus, in accordance with 37 C.F.R. § 41.37(c)(1)(vii), we select claim 1 as representative.

Appellant argues that the combination of Moreton and Ishihara does not teach or suggest a plurality of optical systems, each having a light-limiting means, as claimed. (App. Br. 4-6; Reply Br. 4-5.) In particular,

Appellant argues that "*Moreton* teaches a plurality of optical systems, yet none of its optical systems has a light-limiting means. Further, *Moreton* teaches using a single common lens for all of its optical systems, instead of a lens for each optical system." (App. Br. 5.) Appellant also argues that:

[i]t would not make sense to include two light-emitting means in *Moreton* (*i.e.* one for each image-capturing region), because this would block the light coming to *Moreton's* single common lens. And if a single light-emitting means is added to *Moreton*, this fails to teach Appellant's claimed light-limiting means and lens provided in each of a plurality of optical systems.

(App. Br. 5.) We do not agree.

As the Examiner correctly found, *Moreton* teaches the use of a light-limiting means (diaphragm structure) in Figure 1 where light 5a, 5b is allowed to pass through slits 4a, 4b. (Ans. 4-5, 8; *Moreton* col. 1, ll. 49-50 and Fig. 1.) In addition, the light-limiting means 4a, 4b taught by *Moreton* is shown in an optical path prior to lenses 10a, 10b. *Moreton* explains that the disadvantage of the system of Figure 1 is caused by having two separate CCD circuits 15a and 15b (col. 1, l. 66 to col. 2, l. 10) and further explains that the disadvantage is overcome by a single sensor such as the single image sensor (CCD) 50 shown in Fig. 2A (col. 6, ll. 36-56).

Using the prior art light-limiting means 4a, 4b and lenses 10a, 10b disclosed in *Moreton's* Figure 1 in place of the single lens 45 in Figure 2A would provide a light-limiting means for each optical system, as claimed. Such a replacement is no more than the combination of familiar elements according to known methods, with predictable results. The combination

would have been suggested to a person of ordinary skill in the art viewing Figures 1 and 2A of Moreton together. As such, if the two light-limiting means 4a and 4b are positioned far enough apart from each other, two lenses, similar to those shown in Figure 1, would have been needed to provide the left and right images to the two regions 50a, 50b of image sensor (CCD) 50.

The teachings of Ishihara are cumulative and further buttress the teachings of Moreton. The Examiner correctly found that Ishihara discloses the conventional use of a light-limiting means (diaphragm 12) provided in an optical path between an imaging side reflection means 21 and a lens 23 in a three dimension shape measuring apparatus. (Ans. 5; Ishihara col. 8, l. 54 to col. 9, l. 3; Fig. 5.) Ishihara teaches that the light-limiting means (diaphragm) is used to cut stray light. (Ishihara, col. 8, l. 65 to col. 9, l. 3.)

We note that the light-limiting means claim limitation would be met even using the single lens 45 of Moreton's Figure 2A. As discussed, both Moreton and Ishihara teach the use of a light-limiting means (diaphragm structure). Figure 2A of Moreton discloses two optical systems, a left channel 90a of optical assembly 90 and a right channel 90b of optical assembly 90. (Moreton col. 5, ll. 31-36.) We agree with the Examiner that it would have been obvious to use a light-limiting means for each optical system. Indeed, it would be common sense to use a diaphragm for each beam of light, as demonstrated by the prior art structure 4a, 4b of Figure 1.

However, even the use of a single lens and a single light-limiting means shared by multiple optical systems would meet the claimed light-

limiting means under the broadest reasonable interpretation consistent with the Specification. The claim does not prohibit sharing components. The claim merely requires that each optical system have the recited components, including a lens and light-limiting means. Thus, for example, two optical systems that share a lens and a light-limiting means still meet the claim because each system includes a lens and a light-limiting means.

Appellant also argues that the combination of Moreton and Suzuki does not teach or suggest an infrared cut filter, as claimed. (App. Br. 6-7; Reply Br. 5.) In particular, Appellant argues that "one [of ordinary] skill in the art would not have been motivated to combine *Suzuki's* infrared cut filter with *Moreton's* device, because *Suzuki* fails to relate to a multi-image capturing device . . . [and] *Moreton* fails to suggest the use of an infrared filter." (App. Br. 7.) We do not agree.

As the Examiner correctly found, Suzuki is directed to an image pickup apparatus and teaches the conventional use of an infrared cut filter 12 provided in an optical path between a lens 10 and a solid state image-sensing device 13. (Ans. 5-6, 9; Suzuki col. 2, ll. 37-46 and Fig. 29; *see also* Suzuki col. 12, ll. 1-3 and Fig. 7, col. 28, ll. 24-26 and Fig. 26.) The combination of a conventional infrared cut filter with the optical system for single camera stereo video taught by Moreton would have been no more than the combination of familiar elements according to known methods, with predictable results. There is no evidence that such a combination would have been beyond the level of ordinary skill in the art.

Appellant argues that the Examiner has used impermissible hindsight and that there is no motivation to combine Moreton with Ishihara or Suzuki. (App. Br. 7-8; Reply Br. 6.) We do not agree. The Examiner has articulated a reason to combine Moreton with both Ishihara and Suzuki in the manner claimed (Ans. 4-6.), and we do not find that the Examiner has engaged in impermissible hindsight reasoning.

Accordingly, we conclude that Appellant has not shown that the Examiner erred in rejecting claim 1 under 35 U.S.C. § 103(a). Claims 2 and 5 were argued as a group with claim 1, and fall together with claim 1.

Regarding claim 6, Appellant argues that Tabata does not teach or suggest either a light-limiting means or an infrared cut filter and therefore does not cure the deficiencies argued with respect to claim 1. (App. Br. 8.) However, as discussed with respect to claim 1, we find that the applied references teach these limitations.

In an argument first raised in the Reply Brief, Appellant also argues that the applied references do not disclose or suggest a device having parallax of one centimeter or greater between viewpoints, as claimed. (Reply Br. 6-7.) We do not agree.

The system of Moreton discloses a device having parallax between viewpoints. For example, Moreton teaches that it is desirable to provide "stereo video images within a single-sensor camera system wherein parallax between left and right views is obtained without requiring relative motion between object and camera" (col. 2, ll. 54-57) and that "left and right optical channels (90a and 90b) are disposed so that a predetermined distance 36

separates viewpoints 37a and 37b, thereby differentiating images captured by the left and right optical channels into a stereo image pair" (col. 5, ll. 43-47; Figs. 2A, 2B).

As the Examiner correctly found, Appellant has not shown specific criticality of the broad "one centimeter or greater" distance between viewpoints limitation. (Ans. 7.) It would have been well within the level of ordinary skill in the art to have provided a system with a parallax distance 36 of one centimeter or greater between viewpoints 37a and 37b, with no unexpected results. The teachings of Tabata with respect to parallax (Ans. 7) are cumulative to those of Moreton and further buttress the teachings of Moreton.

Accordingly, we conclude that Appellant has not shown that the Examiner erred in rejecting claim 6 under 35 U.S.C. § 103(a).

CONCLUSION OF LAW

We conclude that Appellant has not shown that the Examiner erred in rejecting claims 1, 2, 5, and 6.

DECISION

The rejection of claims 1, 2, 5, and 6 for obviousness under 35 U.S.C. § 103 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

Appeal 2007-3032
Application 09/362,058

AFFIRMED

gvw

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